REMARKS

Claims 1 - 4 and 9 - 15 remain active in this application. New claims 16 and 17 have been presented. Claims 5 - 8 have previously been canceled. Claims 1 and 9 have been amended to even more clearly define the subject matter regarded as the invention and to emphasize errors in the grounds of rejection asserted in the present action. Support for the amendments of the claims is found throughout the application, particularly in the specification at pages 20 and 23. Support for new claims 16 and 17 clearly appears in Figure 1 of the drawings, as originally filed. No new matter has been introduced into the application.

It is noted for the record that the present office action of March 17, 2004, is the *sixth* action on the merits of the present application (not including two Advisory Actions and the requirement for restriction of December 17, 2001, making, in total, *nine* office actions). Further, as has been pointed out in previous responses and in the remarks provided below, the Examiner continues to fail to directly address features of the invention expressly recited in the claims and supporting the meritorious effects thereof; failing, in most instances, to make a *prima facie* demonstration of the propriety of the asserted grounds of rejection in the application. In view of the protracted prosecution of this application, supervisory review is respectfully requested in accordance with M.P.E.P. §707.02.

The Examiner has repeated the objection to the proposed drawing revisions which seek to label Figures 9A - 9C as "Related Art" instead of "Prior Art" insisted upon by the Examiner. This objection is again respectfully traversed, particularly since the Examiner's observation that the Figures are "identified in the specification as illustrating conventional art" is respectfully submitted to be in error.

Specifically, the discussion of Figures 9A - 9C on page 4 of the specification has been reviewed and no reference to these Figures as "conventional" is seen. As previously pointed out, while the word "conventional" is used in the statement of the Brief Description of the drawings, the context is:

> "Figures 9A, 9B and 9C are *conceptual* views for *explaining* the inkjet recording head of the present invention *and* the conventional inkjet recording head." (emphasis added).

The clear import of this passage is that the illustration is *conceptual* and not of any particular known device and that it is not exclusively limited to that which is conventional while not necessarily including or excluding the invention. Therefore, since the Examiner must consider everything the Applicant has said about the prior art to determine the scope of any admission, as noted in In re Nomiya, previously cited, the Examiner may not misconstrue the above statement to force an admission which might contradict the above statement in the specification.

Nevertheless, to expeditiously resolve the issue, approval has been requested, above, to label Figures 9A, 9B and 9C as "Conventional Art" as the Examiner has required. Accordingly the objection and requirement have been rendered moot and reconsideration and withdrawal of the same is respectfully requested.

Claims 1, 2, 9 and 10 have been rejected under 35 U.S.C. §102 as being anticipated by Hock and claims 1, 2, 4, 9, 10 and 12 have been rejected under 35 U.S.C. §102 as being anticipated by Usui et al. These grounds of rejection are respectfully traversed since both asserted grounds of rejection rely on a construction of the claims contrary to the actual claim recitations and thus fails to make a *prima facie* demonstration of anticipation of any claim by either reference.

Specifically, it is respectfully called to the Examiner's attention that claims 1 and 9, as originally filed and as now amended, both recite two basic elements: 1.) a head body (which, in turn, includes orifices (now an orifice plate having orifices) and a substrate which includes ink ejection units, individual flow paths and a common flow path) and 2.) a metal film on a portion of a surface of the head body. In the respective statements of the rejections based on Hock and Usui et al., the Examiner seeks to read the recited metal film, claimed as a separate element from the head body, on a metal orifice plate (Hock) or metallization of the orifice plate (Usui et al.) of the respective references. It is respectfully submitted that such a construction is inconsistent with and does not answer the recitations of the claims since, if the metal or metallization of the orifice plate of the respective references is considered to meet the metal film recitation, the orifice (or, now, orifice plate) recitations of claims 1 and 9 are not answered. Conversely, if the orifice plate of the references in considered to answer the orifice or orifice plate recitations of the head body of the invention, as claimed, then no structure disclosed in the references answers the "metal film" recitations of independent claims 1 and 9. Therefore, it is clear *from the statements of the respective rejections* that the grounds of rejection are in error and unsupported by the references relied upon.

Moreover, it is respectfully submitted that the respective references relied upon do not reasonably answer the metal film recitation of the claims at all or other recitations of the claims. In regard to Hock, a metal orifice *plate* cannot reasonably be considered to be either a "metal film" or "on a part of at least one side of said head body". To form an orifice the orifice plate must be more than a "film" and must

extend into locations which are unsupported by the head body and thus not "on a part of at least one side of said head body". Moreover, in Hock, the substrate does not include the ink passages claimed but, rather, the passages are formed above the substrate (and the ink ejection units) by channels 23 and 25 (see Figure 2 of Hock) formed in the polymer barrier layer 19 which overlies the substrate 11 and the ink ejection heater structures 13, 15, 17. In regard to Usui et al. it is respectfully submitted that no metallization, as such, remains in the completed print head and the Examiner's reference to a thin film on the head body is illusory. Metal layer 13 of Usui et al., on which the Examiner explicitly relies, is overlaid with a layer 14 of a sulfur compound and the layers are reacted with each other to be bonded covalently; thus forming a single water repellent sulfur compound layer on the orifice plate 1a which controls the meniscus in the orifice and removes ink from the face of the orifice plate. Therefore, it is respectfully submitted that Usui et al. does not reasonably teach a print head or printer including "a metal film on a part of at least one side of said head body". Finally, it is respectfully submitted that neither reference remotely recognizes the problem addressed by the present invention (e.g. avoiding cracking or propagation of cracks in a substrate perforated by an array of ink passages where nucleation of cracking is made more likely by the array of passages) and thus do not and cannot anticipate (or, for that matter, provide evidence of obviousness of) the solution provided by the invention of providing a metal film on a portion of a side of the head body as explicitly recited in the claims.

For the above reasons, it is respectfully submitted that neither Hock nor Usui et al. anticipates any claim in the application and the stated grounds of rejection are clearly in error and unsupported by the

references relied upon by the Examiner, as is abundantly evident from the respective statements of the rejections. Accordingly, reconsideration and withdrawal of the asserted grounds of rejection based on Hock and Usui et al. are respectfully requested.

Additionally, claims 1, 3, 9, 11 and 13 - 15 have been rejected under 35 U.S.C. §103 as being unpatentable over the admitted prior art of Figure 8 in view of Nagahata et al. and claims 2, 4, 10 and 12 have been rejected under 35 U.S.C. §103 as being unpatentable over the admitted prior art of Figure 8 in view of Nagahata et al. in view of Gaynes et al. These grounds of rejection are also respectfully traversed. It is noted, for the record, that these grounds of rejection are essentially repeated from several prior actions with Nagahata et al. substituted for Kitahiro, previously applied and now overcome.

While the Examiner's observations concerning the *structure* illustrated in Prior Art Figure 8 are substantially correct, it is respectfully submitted that the admitted prior art does not extend to recognition of the problem addressed by the invention or recognition of the likelihood of success in achieving a solution to that problem by providing a metal film on a portion of a side of the head body in accordance with the present invention. Therefore, it is respectfully submitted that the admitted prior art cannot supply motivation for the *modification* of the admitted prior art, as claimed. Accordingly, it is respectfully submitted that the Examiner's statement that the admitted prior art "teaches the claimed invention with the exception of a metal film on a part of at least one side of the head body" may be somewhat of an overstatement to the extent that it may infer that the prior art includes recognition of a need for the addition of a metal film or any other expedient to avoid cracking or propagation of cracks in the prior

art structure. That is, any motivation for any proposed modification of the admitted prior art structure cannot be derived from the admitted prior art structure except through impermissible hindsight in light of the present specification.

In any case, the Examiner admits that the admitted prior art does not teach or suggest the provision of "a metal film at least on a part of at least one side of said head body" and relies on Nagahata et al. to supply such a teaching and motivation for its inclusion in combination with the admitted prior art head body structure and it is respectfully submitted that Nagahata et al. does not do so. Nagahata et al. discloses a "support *plate* 18" (emphasis added) which is intended to function as a heat sink for the substrate as well as to "reinforce" the substrate and acknowledges that the substrate is "relatively brittle" (column 8, lines 44 - 48, as noted by the Examiner). However, in the immediately following text of Nagahata et al. it is noted that support plate 18 can be provided as part of the print head *or* as part of the printer, to which the print head may be later attached. Further, the immediately following text in column 8, lines 58+, indicate that the head substrate 2 is preferably attached "only at a longitudinally central portion of the substrate" to prevent thermal bending due to differential thermal expansion between plate 18 and substrate 2 being imposed on substrate 2. It should also be noted that the disclosed function of plate 18 as a heat sink favors increased thickness of the plate structure to reduce thermal resistance of the thermal path and that the imposition of thermal bending is a function of the relative thickness of the substrate and the plate since the forces developed by thermal expansion are a function of the cross-sectional area in a plane perpendicular to the direction in which thermal expansion is resisted by another structure to

which a given structure is attached. Thus, Nagahata et al. not only fails to address the prevention of growth of a crack but teaches away from the invention in accommodating a totally different purpose.

In this regard, it should also be noted that while the specification indicates, on page 22, lines 10 - 11, that no limitation is given to the thickness of the metal film of the invention, it is made clear from the discussion beginning at page 22, line 12, and continuing through page 23, that the meritorious effects of the invention will not be achieved unless the metal film thickness is maintained within limits sufficient to act as a "film" (having flexibility and elasticity to avoid stressing the substrate unduly while placed *on* a portion of a side of the head body including the substrate, also further supporting new claims 16 and 17, in order to provide continuous coverage at crack nucleation sites which avoids propagation of cracks in the substrate where the substrate is weakened and the stresses concentrated by arrayed passages and orifices therein) rather than as a "plate" as in Nagahata et al. which, to function as a heat sink and "support" the substrate, as disclosed therein, must be of sufficient thickness to cause undesirable stressing of the substrate if continuously attached or provided "*on* a portion of a surface...". Thus, the "plate" of Nagahata et al. *essentially requires* attachment to the substrate "only" at a central portion thereof which prevents the meritorious effect of the present invention from being achieved. Conversely, there is no motivation in Nagahata et al. for using a "film" instead of plate 18 as a modification to the admitted prior art (which the Examiner does not propose) since use of a film in Nagahata et al. would prevent the intended function as an effective heat sink (and thus be an improper modification thereof in accordance with In re Gordon,

221 USPQ 1125 (Fed. Circ., 1984)) while the preferable and apparently necessary technique of attaching the substrate and plate 18 together only at a central portion thereof, as disclosed by Nagahata et al. would not provide the meritorious function of the invention in preventing propagation of cracks in the substrate; of which there is no suggestion in Nagahata et al. beyond the general phrase "reinforcing the substrate" (column 8, line 48) which does not indicate any particular type of damage the "reinforcement" seeks to avoid.

Similarly, Gaynes et al., as previously pointed out, is cited by the Examiner only for the teaching of a nickel layer of 0.1 to 4 microns in thickness for avoiding cracking of a semiconductor chip due to warping caused by thermal cycling which is contrary to the teachings of Nagahata et al., and does not provide motivation for the combination with the admitted prior art and Nagahata et al. or further modification of Nagahata et al. or provide evidence of a level of ordinary skill in the art which would support a conclusion of obviousness since it does not lead to an expectation of success in avoiding substrate cracking at crack nucleation sites caused by arrayed ink passages in a print head. On the contrary, Gaynes et al. tends to teach away from the present invention since it attributes warpage and bending of the substrate during thermal cycling to the metallization on one side of the chip (see column 1, lines 14 - 32). Therefore, Gaynes et al. does not mitigate the basic deficiencies of the combination of the admitted prior art and Nagahata et al. to answer the recitations of the claims.

In summary, while Nagahata et al. may teach a metal support *plate* located *at* a portion of a side of a head body for generalized reinforcement purposes, Nagahata et al. does not teach or suggest "a metal *film*

... *on* a part of at least one side of said head body" or lead to an expectation of success in avoiding propagation of cracking of a substrate by provision of such a metal *film on a surface* of the head body. The above amendments are intended to emphasize this distinction by indicating that the film is of "limited thickness" and thus cannot be answered by a "plate", however the Examiner might propose to modify it. Therefore, it is respectfully submitted that the combination of teachings or suggestions of the admitted prior art and Nagahata et al. (and Gaynes et al.) does not, in fact, answer the recitations of any claim in the application or provide motivation for the combination and, moreover, the conclusion of obviousness asserted by the Examiner can only be reached through utilization of impermissible hindsight in light of the teachings of the present specification.

Accordingly, it is respectfully submitted that the grounds of rejection based on the admitted prior art and Nagahata et al. (and Gaynes et al.) are clearly in error and unsupported by the prior art relied upon. It is also respectfully submitted that the Examiner has not made and cannot make a *prima facie* demonstration of obviousness of any claim in the application based on these combinations of prior art. Therefore, it is respectfully requested that these grounds of rejection be reconsidered and withdrawn.

Since all rejections, objections and requirements contained in the outstanding official action have been fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041 (Whitham, Curtis & Christofferson).

Respectfully submitted,

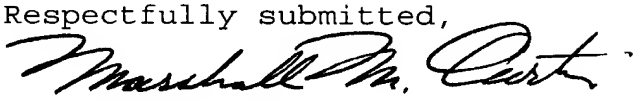

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FIG. 8
PRIOR ART

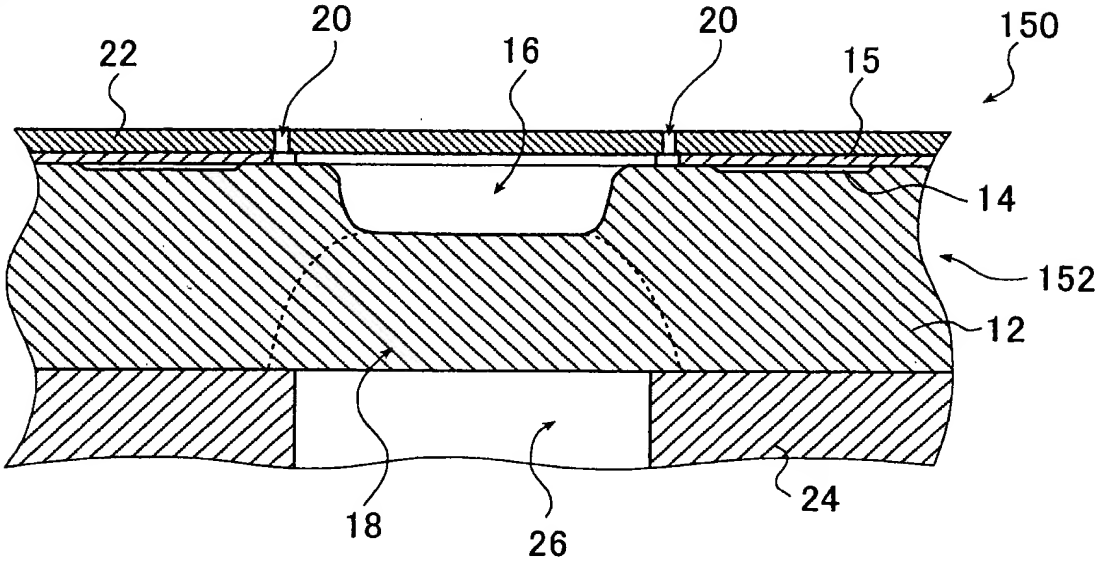

FIG. 9A
CONVENTIONAL ART

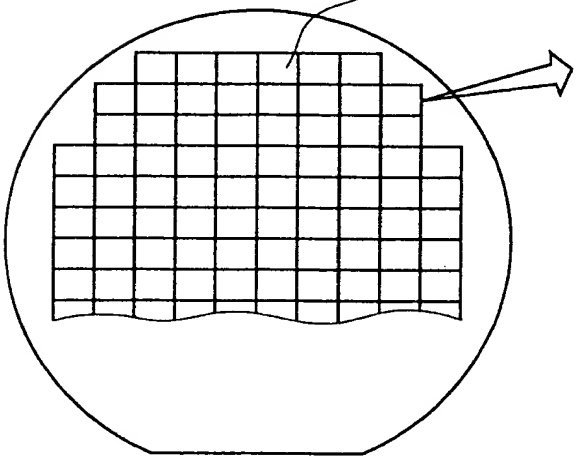

FIG. 9B
CONVENTIONAL ART

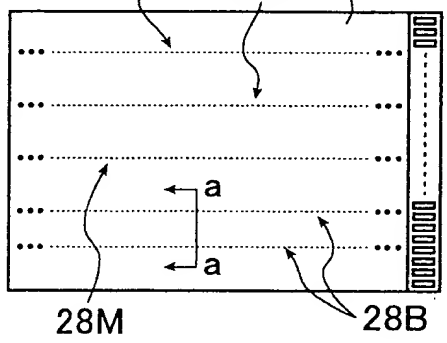

FIG. 9C
CONVENTIONAL ART